

L 9235-66 EWT(m)/EWP(w)/EPF(n)-2/EWA(d)/EWP(y)/T/EWP(t)/EWP(k)/EWP(z)/EWP(h)/EWA(h)/  
ACC NR: AT5023783 EWA(c) MJW/JD/HM/GG/ GS SOURCE CODE: UR/0000/62/000/000/0058/0067

AUTHOR: Amayev, A. D.; Yefimov, A. V.; Platonov, P. A.; Pravdyuk, N. F.; Razov, I. A.;  
Khlebnikov, A. M.

ORG: none

TITLE: Effect of neutron irradiation on the mechanical properties of heat-resistant ferritic-pearlitic steels and on their welded joints

SOURCE: Soveshchaniye po probleme Deystviye yadernykh izlucheniya na materialy. Moscow, 1960. Deystviye yadernykh izlucheniya na materialy (The effect of nuclear radiation on materials); doklady soveschaniya. Moscow, Izd-vo AN SSSR, 1962, 58-67

TOPIC TAGS: ferritic pearlitic steel, neutron irradiation, steel irradiation, steel property, weld property/25Kh2MFA steel, 12Kh2MFA steel

ABSTRACT: The effect of neutron irradiation on the mechanical properties of ferritic-pearlitic steels and their welded joints has been investigated. Specimens of annealed and tempered 25Kh2MFA and 12Kh2MFA chromium-molybdenum-vanadium steels with 0.2% and 0.1% C, respectively, were irradiated at 80-305C with integrated neutron fluxes of  $2.8 \times 10^{17}$ — $7.2 \times 10^{19}$  n/cm<sup>2</sup> (35% of neutrons with energy > 1). Mechanical tests of both steels and of 12Kh2MFA steel welds showed that neutron irradiation increases strength and decreases ductility and notch toughness, but not as much as in 25KhNM steel or 20 steel irradiated under the same conditions. This shows that metal strengthened by means of alloying or heat treatment, plastic

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deformation or dispersion hardening is less sensitive to irradiation. The mechanical properties of 12Kh2MFA steel welds obtained by manual or automatic welding with 12KhMF or 12KhM electrode wires undergo practically the same change as the base metal when irradiated with a  $7 \cdot 10^{19}$  n/cm<sup>2</sup> flux. However, this change is slightly more pronounced in welds obtained with 12KhM wire, owing to its lower content of alloying elements. Increasing the temperature of irradiation decreased the radiation damage in all tested steels and diminished the degree of change in mechanical properties, because the damage is partially or completely eliminated by annealing. The highest temperatures at which no change of mechanical properties of ferritic-pearlitic steels and their welds occurs under effect of irradiation with neutron flux of the indicated intensity are 350—400C. At an irradiation temperature of 100C, none of the tested steels attains the highest values of strength, ductility, and toughness, unless the flux of fast neutrons is  $10^{20}$  n/cm<sup>2</sup>. Orig. art. has: 9 figures and 4 tables. [ND]

SUB CODE: 11, 20/ SUBM DATE: 18Aug62/ ORIG REF: 003

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L 10800-66 EWT(m)/EWP(w)/EPF(n)-2/EWA(d)/T/EWP(+)/EWP(z)/EWP(b)/EWA(h) IJP(z)  
 ACC NR: AT5023784 MJW/JD/JG/GG/GS SOURCE CODE: UR/0000/62/000/000/0068/0073

AUTHOR: Yefimov, A. V.; Kozhevnikov, O. A.; Nikolayev, V. A.; Pravdyuk, N. F.;  
 Razov, I. A.; Khlebrikov, A. M.

ORG: none

TITLE: Effect of neutron irradiation on the mechanical properties of stainless  
 austenitic steels of various strength

SOURCE: Soveshchaniye po probleme Deystviye yadernykh izlucheniya na materialy.  
 Moscow, 1960. Deystviye yadernykh izlucheniya na materialy (The effect of nuclear  
 radiation on materials); doklady soveshchaniya. Moscow, Izd-vo AN SSSR, 1962.  
 68-73

TOPIC TAGS: austenitic steel, austenitic alloy steel, neutron irradiation, steel  
 irradiation, steel property

ABSTRACT: The effect of neutron irradiation on the mechanical properties of stainless  
 austenitic steels has been investigated. 1Kh18N9T steel austenitized at 1000C or  
 austenitized at this temperature and cold rolled with 25% elongation, and austenitic,  
 dispersion-hardenable, chromium-nickel steel of the 18-22 type, alloyed with tungsten  
 and titanium, were irradiated with integrated fluxes of  $7.4 \times 10^{20}$  or  $2 \times 10^{20}$  n/cm<sup>2</sup>  
 with energy > 1MeV at 100C, 300C, or 500C. Tests showed that irradiation of as-  
 austenitized 1Kh18N9T steel at 100C with  $7.4 \times 10^{19}$  n/cm<sup>2</sup> increases the yield and  
 tensile strengths by 101% and 24%, respectively, and decreases the elongation and  
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ACC NR: AT5023784

notch toughness by 39% and 20%. The same irradiation increases the yield and tensile strengths of austenitized and cold-rolled 1Kh18N9T steel only by 27% and 21%, and decreases its elongation and notch toughness by 38% and 42%. Increasing the irradiation intensity from  $7.4 \times 10^{19}$  to  $2.10^{20}$  n/cm<sup>2</sup> has no effect on the properties of this steel. Increasing the temperature of irradiation with  $7.4 \times 10^{19}$  n/cm<sup>2</sup> from 100 to 300 to 500C decreases the yield strength of austenitized and cold-rolled steel by 11% and 30% below that of steel irradiated at 100C. The tensile strength drops in this case by 4 and 17%, but the elongation increases by 44 and 148%. The mechanical properties of stainless chromium-nickel steel alloyed with tungsten and titanium and austenitized and aged at 710C for 10 hours, do not change much under the effect of fast-neutron irradiation at  $2 \times 10^{20}$  n/cm<sup>2</sup>, except for the yield strength, which increases by 30%. Orig. art. has: 4 figures and 2 tables. [ND]

SUB CODE: /3, 20 SUBM DATE: 18Aug62/ ORIG REF: 003/ OTH REF: 008

60  
Card 2/2

[illegible]

ACC NR: AP6007751

SOURCE CODE: UR/0293/66/004/001/0170/0172

AUTHORS: Kurnosova, L. V.; Mandel'shtam, S. L.; Razorenov, L. A.; Tindo, I. P.;  
Fradkin, M. I.

ORG: none

TITLE: Occurrences of transient increase in the flux of heavy nuclei following an x-ray radiation burst

SOURCE: Kosmicheskiye issledovaniya, v. 4, no. 1, 1966, 170-172

TOPIC TAGS: x radiation, heavy nucleus, artificial satellite, signal to noise ratio , artificial satellite observation, solar atmosphere , solar x radiation

ABSTRACT: The transient increase in the flux of heavy nuclei with  $Z \geq 15$  is discussed for the two periods 22 hr, 31 January, and 02 hr 15 min, 14 February 14, 1964. The duration of the flux was about 16 minutes and seemed to correspond to an x-ray burst recorded by the instruments on the artificial satellite "Elektron-2." The instruments were Cherenkov detectors with an area of  $5 \text{ cm}^2$ . During this sudden increase, the satellite was at an altitude of  $6.6 \times 10^4 \text{ km}$  and the wavelength of the recorded x-rays was  $\lambda < 10 \text{ \AA}$ . It is shown after some detailed discussion that this event could not be caused by statistical fluctuations because the chances for recording 100 such events on the basis of statistical fluctuations in x-rays would be less than  $8.2 \times 10^{-2}$ .

Orig. art. has: 2 figures and 2 formulas.

SUB CORR: 04, 20/ SUBM DATE: 26Jul65/ ORIG REF: 004

ACC NR: AP7002626 (A,N) SOURCE CODE: UR/0413/66/000/G23/G165/G165

INVENTOR: Razorenov, L. A.

ORG: None

TITLE: A transistorized switch. Class 21, No. 165,65

SOURCE: Izobreteniya, promyshlennyye obraztsy, tovarnyye znaki, no. 23, 1966, 165

TOPIC TAGS: electronic switch, transistorized circuit

ABSTRACT: This Author's Certificate introduces a transistorized switch for voltage of either polarity. The unit is controlled by "on" and "off" AC generators. The device is designed for increased accuracy and stability over a range of temperature variations. The switch is made from two pairs of transistors connected back to back and operating alternately in "blocking" and "saturation" conditions. These transistors form a ladder network with the voltage to be switched connected to the terminal points. The collectors and bases of the transistors in each pair are tied together and cross connected through rectifiers to the control windings of transformers fed by the generators. The load is connected in the common emitter circuit between the transistor pairs.

SUB CODE: 09/ SUBM DATE: 14Aug62

Card 1/1

ACC NR: AP7000517

SOURCE CODE: UR/0048/66/030/011/1755/1759

AUTHOR: Blokh, Ya. L.; Dorman, L. I.; Kurnosova, L. V.; Razorenov, L. A.; Raychenko, L. V.; Suslov, A. A.; Fradkin, M. I.

ORG: none

TITLE: A study of time changes of nuclear flux in primary cosmic radiation on Elektron-2 and Elektron-4 satellites /Paper presented at All-Union Conference on Physics of Cosmic Rays held in Moscow from 15 to 20 November 1965/

SOURCE: AN SSSR. Izvestiya. Seriya fizicheskaya, v. 30, no. 11, 1966, 1755-1759

TOPIC TAGS: primary cosmic ray, cosmic ray measurement, cosmic ray intensity, *micronlogic satellite*, *nuclear flux*, *neutron flux*

ABSTRACT: Some results of a study of primary cosmic radiation conducted using the Elektron-2 and Elektron-4 satellites are given. An integral Cherenkov counter was placed in each satellite to measure fluxes of nuclei with energies greater than 600 Mev/nucleon. Those nuclei belonging to groups  $Z \geq 2$ ,  $Z \geq 5$ ,  $Z \geq 15$  were measured by the Elektron-2, and those of group  $Z > 20$  by the Elektron-4. Average flux values measured for the above groups of nuclei relative to the average flux values obtained during July 1964 are given in Fig. 1. The above data covers the period from 30 Jan 1964 through 9 Feb 1965. The fluxes

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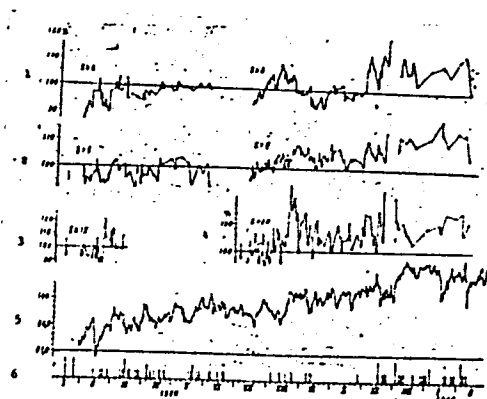


Fig. 1. Relative values of primary cosmic ray flux obtained by Elektron-2 and Elektron-4 satellites and by a ground station

1, 2, 3, 4 - Relative fluxes of nuclei with  $Z \geq 2$ ,  $Z \geq 5$ ,  $Z \geq 15$  (right-hand graph) and magnitudes of statistical error of the mid-day values; 5, 6 - cosmic flux values obtained by the neutron monitor, and flux caused by chromospheric flares (the sizes of vertical lines correspond to flares of particles 1, 1+, and 2) registered at the Climax ground station.

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ACC NR: AP7000517

measured at midday by the satellites are in close correlation with those measured by the ground stations for quiet ground conditions. It is noted that nuclear flux increased by a factor of 1.7—2 during the period from 1959 to 1964. During the same period the flux registered by a neutron monitor at the Climax ground station increased by about 20%. During 1964—1965 as was anticipated the nuclear flux increased by about 15% for nuclei with  $Z \geq 2$  and  $Z \geq 5$ . The accuracy of measurements of the flux increase of nuclei with  $Z > 20$  during the flight of the Elektron-4 satellite was impaired by several rises in flux and by significant statistical errors. Orig. art. has: 3 figures.

[WA-75]  
[IV]

SUB CODE: 04, 18, 20/  
OTH REF: 007

SUBM DATE: none/

ORIG REF: 007/

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L 6954-66 EPF(c)/ENA(h)/EWT(1)/EWT(m)/FCC RPL GW/WW

ACC NR: AP5026226

SOURCE CODE: UR/0048/65/029/010/1846/1852

AUTHOR: Kurnosova, L.V.; Razorenov, L.A./Fradkin, M.I.

ORG: none

TITLE: Composition and energy spectrum of the primary cosmic rays in the moderate-energy region /Report, All-Union Conference on Cosmic Ray Physics held at Apatity, 24-31 August 1964/

SOURCE: AN SSSR. Izvestiya. Seriya fizicheskaya, v.29, no.10, 1965, 1846-1852

TOPIC TAGS: Primary cosmic ray, spectral energy distribution, chemical composition, cosmic radiation composition, interplanetary space.

ABSTRACT: Recent literature on the energy distribution and composition of the primary cosmic rays with energies between  $10^8$  and  $10^{10}$  eV/nucleon is reviewed. For energies above 2 BeV/nucleon the exponent in the energy spectrum is 1.5 and is the same for all components. The Li-Be-B question can be regarded as settled. The ratio L/S of the number of these nuclei to the number of heavier nuclei is between 0.2 and 0.3, and appears to increase with decreasing energy. The increase of L/S with decreasing energy probably indicates that the low-energy primary cosmic ray particles traverse a greater thickness of interstellar matter than do the high-energy particles. The ratio H/M of the number of heavy to the number of medium-mass nuclei in the pri-

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ACC NR: AP5026226

mary cosmic radiation appears to be approximately 1/3; there are some discordant data, however, and further measurements are necessary. The ratio H/M is greater in the cosmic radiation than in the universe as a whole. Data on the fluxes of separate nuclei of the heavy group are greatly to be desired. The flux of cosmic rays with energies between  $10^8$  and  $10^9$  eV/nucleon is modulated by solar activity and diluted by particles of solar origin. Measurements of  $\alpha$  particle fluxes have shown that the high latitude cutoff is a rigidity effect and is therefore due to magnetic fields rather than to ionization losses. If the high latitude cutoff were due to irregular magnetic fields frozen into the interplanetary gas ejected from the sun, one would expect the cosmic ray intensity to vary with distance from the sun. Such a variation is not confirmed by measurements with Pioneer 1, Mars 1, and Mariner 2. A small intensity gradient derived from a comparison of Mariner 2 with terrestrial data is questioned because of the dissimilarity of the rocket and terrestrial instruments. The conclusion of R. Vogt (Phys.Rev., 125, 366 (1962) that there exist low-energy protons of solar origin which, however, do not arrive directly from the sun, is questioned because of the sharp cutoff observed beyond the radiation belts at  $52^\circ$  latitude by Explorer 7. It is suggested that Vogt's protons may have originated in unrecorded solar flares or that the effect of atmospheric secondaries may not have been taken properly into account. The low positron content (20%) of the electron component of the primary cosmic radiation shows that the electrons are not to be accounted for by meson decay. There is evidence that the composition of cosmic rays of solar origin is the same as that of the solar atmosphere. There are some indications that

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ACC NR: AP5026226

heavy nuclei may be preferentially accelerated on the Sun. The data on this question, however, are contradictory, and more observations with instruments of greater luminosity are necessary. Orig. art. has: 4 figures and 2 tables.

SUB CODE: AA SUBM DATE: 00/--Oct 65 ORIG.REF: 007 OTH REF:021

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KURNOSOVA, L.V.; LOGACHEV, V.I.; PLATONOV, G.F.; RAZORENOV, L.A.; SINITSINA,  
V.G.; SUSLOV, A.A.; PRADKIN, M.I.

Preliminary results of studying the nuclear component of cosmic  
rays with the aid of the artificial satellite "Elektron-2."  
Izv. AN SSSR.Ser.fiz. 29 no.10:1853-1858 0 '65.

(MIRA 18:10)

1. Laboratoriya kosmicheskikh luchey Fizicheskogo instituta im.  
P.N.Lebedeva AN SSSR.

L 1888-66 EWT(1)/EWT(m)/FCC/T/EWA(h) IJP(c) GS/GW  
ACCESSION NR: AT5022822

UR/0000/65/000/000/0008/0022

AUTHOR: Ginzburg, V. L.; Kurnosova, L. V.; Logachev, V. I.; Razorenov, L. A.;  
Fradkin, M. I.

TITLE: Primary component<sup>19</sup> of cosmic rays

SOURCE: Vsesoyuznoye soveshchaniye po kosmofizicheskomu napravleniyu issledo-  
vaniy kosmicheskikh luchey. 1st, Yakutsk, 1962, Kosmicheskiye luchy i problemy  
kosmofiziki (Cosmic rays and problems in cosmophysics); trudy soveshchaniya.  
Novosibirsk, Redizdat Sib. otd. AN SSSR, 1965, 8-22

TOPIC TAGS: primary cosmic ray, cosmic ray particle, cosmic ray measurement,  
cosmic radiation composition

ABSTRACT: The article is a survey of reported experimental data on the composi-  
tion of cosmic rays. The following groups of nuclei (other than protons and  
alpha particles) with charge  $Z \geq 3$  are considered: (1) light nuclei with  
charge  $3 \leq Z \leq 5$  (group L); (2) nuclei of the middle group with  $6 \leq Z \leq 9$ ; (3)  
heavy nuclei with  $Z > 10$  (group H). The symbol S is also used and designates  
nuclei with  $Z \geq 6$  ( $S = M + H$ ). It is shown that fluxes of different nuclei  
(including protons) should be compared for a given value of their hardness. As  
a rough general rule, nuclei of elements with atomic number Z are Z times more

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frequent in cosmic rays than in nature. Difficulties involved in measurements of fluxes of the different groups of nuclei are described. High-altitude experiments definitely indicate the presence of lithium, beryllium, and boron nuclei (20-30% of the quantity of heavier nuclei) in the primary component of cosmic rays in the vicinity of the earth. Findings concerning the electron-positron component of cosmic rays are discussed, and the chemical composition of solar cosmic rays is considered. Differential energy spectra of protons and nuclei and their hardness spectra are analyzed. On the basis of the body of data accumulated thus far it is now possible to state that not only protons, but also multiply-charged nuclei are accelerated on the sun; however, this mechanism of particle acceleration is still unknown, and several such mechanisms may exist. Orig. art. has: 14 figures and 3 tables.

ASSOCIATION: Fizicheskii institut im. N. P. Lebedeva AN SSSR (Physics Institute, AN SSSR)

SUBMITTED: 29Oct64

ENCL: 00

SUB CODE: AA, NP

NO REF SOV: 014

OTHER: 020

*mlr*  
212

L 2326-66 ENT(1)/FCC/EWA(h) GS/GW  
ACCESSION NR: AT5023626

UR/0000/65/000/000/0486/0501

AUTHORS: Ginzburg, V. L.; Kurnosova, L. V.; Razorenov, L. A.; Syrovatskiy, S. I.;  
Fradkin, M. I. 36  
B7D

TITLE: Some problems and perspectives in the investigation of primary cosmic rays 12

SOURCE: Vsesoyuznaya konferentsiya po fizike kosmicheskogo prostranstva. Moscow,  
1965. Issledovaniya kosmicheskogo prostranstva (Space research); trudy konferentsii.  
Moscow, Izd-vo Nauka, 1965, 486-501

TOPIC TAGS: cosmic ray, gamma ray, x ray, solar activity, antiparticle

ABSTRACT: Problems associated with the investigation of primary cosmic rays and gamma rays are presented in a three-part report. Part I deals with the proton-nucleus component of the cosmic rays, Part II covers the electron-positron component, and Part III discusses cosmic gamma- and x-rays. Although the proton-nucleus component of primary cosmic rays has been studied quite completely, a group of problems still remains unanswered. Eight such problems discussed in Part I are: 1) energetic spectra of protons and nuclei in the energy interval below 100 Mev/nucleon. These spectra are represented by the form  $N(E) \sim E^{1.8}$ . 2) The relationship between fluxes of different nuclei groups (L, M, H) in the energy range 55 to 550 Mev/nucleon, which is still not well known. 3) Isotopic components of primary

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cosmic rays. This would require the measurement of three independent parameters such as  $dE/dx$ ,  $E$ , and  $pc$ . 4) The presence of high speed antiprotons generated by the interaction of cosmic rays with interstellar media. Some measurements place the percent composition of antiparticles at 0.23%. 5) The verification of the presence of superheavy nuclei,  $Z > 30$ . 6) Estimates of the time rate of change of the fluxes in primary nuclei components which have their origin either in solar bursts or in modulated galactic cosmic rays. These intensity variations should be recorded continuously, outside the terrestrial atmosphere. 7) Intensity gradients of cosmic rays in the solar system as evidenced by data from Pioneer-5 and Mariner-1. 8) Anisotropy among particle fluxes of low, near-threshold energies. Two similar problems are discussed in Part II. Here the flux and energy spectra of primary cosmic ray electron-positron components are analyzed first, where data are shown to be rather scant. Next, the relationship between positron and electron fluxes is considered by measuring the charge composition of the primary cosmic rays. In Part III, calculation results of expected  $\gamma$ - and x-ray intensities from important galactic sources are considered. The  $\gamma$ -ray generation is attributed to processes such as  $\pi^0$ -meson decay, bremsstrahlung radiation of relativistic electrons and positrons, and Compton  $\gamma$ -rays by the scattering of photons on x-ray electrons. Experiments indicate  $I_\gamma (> 50 \text{ Mev}) \pm 3.5 \times 10^{-4} \text{ photons/cm}^2/\text{sec/stere}$  which is larger than expected galactic estimates. This then implies  $\gamma$ -rays of

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meta-galactic origin. For lower energies (0.51 Mev)  $I_{\gamma} = 1.2$  to  $300 \times 10^{-6}$  photons/cm<sup>2</sup>/sec/stere. Orig. art. has: 6 tables, 2 figures, and 4 formulas. [04]

ASSOCIATION: none

SUBMITTED: 02Sep65

ENCL: 00

SUB CODE: AA, NF

NO REF SOV: 020

OTHER: 046

ATD PRESS: 4107

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L 1538-66 EWT(1)/FCC/EWA(h) GS/GW

ACCESSION NR: AT5023627

UR/0000/65/000/000/0501/0502

AUTHOR: Kurnosova, L. V.; Razorenov, L. A.; Logachev, V. I.; Fradkin, M. I. 57  
44.55 74.55 35

TITLE: Experimental investigations of the composition of primary cosmic rays 61

SOURCE: Vsesoyuznaya konferentsiya po fizike kosmicheskogo prostranstva, Moscow, 1965. Issledovaniya kosmicheskogo prostranstva (Space research); trudy konferentsii. Moscow, Izd-vo Nauka, 1965, 501-502 415

TOPIC TAGS: cosmic ray, cosmic ray measurement, cosmic ray intensity, satellite, satellite mission analysis, nucleus, proton, heavy nucleus, nucleon 97m

ABSTRACT: Results of work conducted with the help of satellites and rockets in 1958-63 for the purpose of studying the nuclear component of cosmic rays are presented. The intensities of various nuclei group streams are given, and the upper limit of the ratio of nuclear streams with  $Z \geq 30-40$  to that with  $Z \geq 15$  is found to be 0.01-0.03%. The ratio of a light nuclear (group L) stream to the stream of nuclei of group  $S = M + H$  was found to be  $31.0 \pm 9.6\%$ . The short-period intensification of nuclear streams is considered in relation to solar chromospheric flares. This intensification proves the existence of solar processes producing the acceleration of nuclei to kinetic energies exceeding  $0.5 \cdot 10^9$  ev/nucleon. It is proposed

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ACCESSION NR: AT5023627

that two mechanisms are active in the sun<sup>12,56</sup>—one leads to the acceleration of protons [04]  
and the other to the acceleration of heavy nuclei.

ASSOCIATION: none

SUBMITTED: 02Sep65

ENCL: 00

SUB CODE: AA, SV

NO REF SOV: 000

OTHER: 000

ATD PRESS: 4098

Card 2/2

L 4089-66 EWT(1)/FCC/EWA(h) CW

ACCESSION NR: AP5026227

AUTHOR: Kurnosova, L.V.; Logachev, V.I.; Platonov, G.F.; Razorenov, L.A.; Sinit-  
sina, V.G.; Suslov, A.A.; Fradkin, M.I. UR/0048/65/029/010/1853/1858 69 68

TITLE: Investigation of low-energy charged particles with the Cosmos 12, Cosmos  
15, and Electron 2 satellites /Report, All-Union Conference on Cosmic Ray Physics  
held at Apatity 24-31 August 1964/

SOURCE: AN SSSR. Izvestiya. Seriya fizicheskaya, v. 29, no. 10, 1965, 1853-1858

TOPIC TAGS: primary cosmic ray, heavy particle, artificial earth satellite,  
Cerenkov counter, scintillation counter, solar activity

ABSTRACT: Equipment carried by Electron 2 to measure the nuclear component of cos-  
mic rays during the International Year of the Quiet Sun is described briefly and a  
few preliminary results are reported. The equipment consisted of a Cerenkov coun-  
ter mounted within the satellite behind 1.5 g/cm<sup>2</sup> of matter and a telescope com-  
posed of a Cerenkov counter and a scintillation counter, mounted outside the satel-  
lite behind 0.6 g/cm<sup>2</sup> of aluminum. All the counters could record cosmic ray parti-  
cles with energies exceeding 600 Mev/nucleon. The external telescope recorded nu-

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of Sciences, SSR)

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clei with charge numbers of 2 or greater, and the external Cerenkov counter, which was part of the telescope, also recorded very heavy nuclei with charge numbers near 30. Nuclei with charge numbers not less than 2, 5, or 15 were recorded in separate channels by the internal Cerenkov counter. The counters were tested and calibrated in the laboratory with the aid of cosmic ray particles; the associated photomultipliers were calibrated with flashes from a SiC diode. Preliminary results are compared with analogous data recorded with the Second Soviet Cosmic Rocket, the Third Soviet Satellite Vehicle, and the Mars 1. A strong negative correlation is indicated between solar activity and the intensity of the nuclear component of the cosmic radiation. The intensity of the nuclear component nearly doubled between the flights of the Second Cosmic Rocket in 1959 and the Electron 2 in 1964. It is anticipated that when the data recorded with the Electron 2 are processed they will provide information concerning the dependence of the nuclear component on solar activity. A number of solar flares occurred in February and March during the flight of the Electron 2. Analysis of the data recorded during these flares is awaited with great interest. Orig. art. has: 1 formula, 6 figures, and 1 table [15]

ASSOCIATION: Laboratoriya kosmicheskikh luchey Fizicheskogo instituta im. P.N. Lebedeva Akademii nauk SSSR (Cosmic Ray Laboratory, Physics Institute, Academy of Sciences, SSR)

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L 4089-66

ACCESSION NR: AP5026227

SUBMITTED: 00  
NO REF SOVI, 001

ENCL: 00  
OTHER: 000

SUB CODE: NP,ES  
ATD PRESS: 4/27

BVK.  
Card 3/3





ACCESSION NR: AP4031621

S/0053/64/082/004/0585/0647

AUTHOR: Ginzburg, V. L.; Kurnosova, L. V.; Razorenov, L. A.; Pradkin, M. I.

TITLE: Investigations of the nuclear component of cosmic radiation performed on Soviet satellites and rockets

SOURCE: Uspekhi fizicheskikh nauk, v. 82, no. 4, 1964, 585-647

TOPIC TAGS: cosmic ray, satellite measurement, space probe, cosmic ray charge distribution, cosmic ray flux, cosmic ray energy spectrum, solar cosmic ray, primary cosmic radiation, nuclear active component, electron positron component, galactic cosmic ray

ABSTRACT: This review summarizes results of measurements of cosmic-ray particle fluxes, cosmic-ray energy spectra, and intensity variations of the cosmic-ray components performed by the authors with satellite-borne equipment and reported in various publications (Geomagnetizm i aeronomiya, v. 2, 193, 1962. Iskustvennyye sputniki zemli, no. 2, 70, 1958; no. 5, 20, 1960; no. 8, 87, 1961; no. 12, 16, 1961; no. 6., 131, 1961; no. 12, 31, 1961; no. 15, 66, 1962. J. Phys. Soc. Japan v. 17. Suppl. A-II, 315, 1962. Izv. AN SSSR ser. fiz. v. 26, 782, 1962).

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The experimental results are compared with the data by others. In addition, some problems and possibilities of cosmic-ray research outside the earth's atmosphere and magnetic field are also discussed. The advantages and limitations of satellite and rocket studies are briefly enumerated. Certain features of Cerenkov counters, which provided the bulk of the information, are discussed. Difficulties in the comparison of the results of different researches and the effect of the solar-activity cycle and of the individual solar flares are extensively dealt with. The correlation with solar radio emission is also discussed in connection with the electron-positron component of cosmic radiation. The section headings are: Introduction. I. Investigation of the nuclear component of cosmic rays with Soviet satellites and space probes. 1. Procedure. 2. Chemical composition of cosmic rays, fluxes of different nuclear groups and their energy spectra. 3. Variations of the flux of the nuclear cosmic-ray component and nuclei of solar origin. II. Use of satellites and rockets to study primary cosmic radiation. 4. Nuclear component of galactic cosmic rays. 5. Solar cosmic rays and high-latitude cutoff. 6. Electron-positron component of cosmic rays. Bibliography. Orig. art. has: 31 figures, 15 tables, and 6 formulas.

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ACCESSION NR: AP4031621

ASSOCIATION: None

SUBMITTED: 00

ATD PRESS: 3059

ENCL: 00

SUB CODE: SV, AA

NO REV SOV: 063

OTHER: 074

Card 3/3

GINZBURG, V. L.; KURNOSOVA, L. V.; RAZORENOV, L. A.; FRADKIN, M. I.;

Studies of the nuclear component of cosmic rays conducted  
on Soviet satellites and rockets. Usp. fiz. nauk 82 no. 4:  
585-647 Ap '64. (MIRA 17:5)

ACCESSION NR: AT3006860

S/2560/63/000/015/0066/0070

AUTHORS: Kurnosova, L.V.; Razorenov, L.A.; Fradkin, M.I.

TITLE: A short-term event of increased radiational intensity recorded on Sputnik-2 on 20 August 1960

SOURCE: AN SSSR. *Iskusst. sputniki Zemli*, no. 15, 1963, 66-70

TOPIC TAGS: satellite, Earth satellite, artificial satellite, artificial Earth satellite, Sputnik, Sputnik-2, telescope, gas-discharge counter, Cherenkov counter, cosmic radiation, proton, solar proton, high-energy nucleus, increase in cosmic-ray intensity, cosmic ray, cosmic-ray intensity

ABSTRACT: With reference to previously reported observations of regions with increased intensity of charged particles termed the "South Atlantic radiational anomaly" (one near the Brazilian coast and another similar region near the shores of Antarctica), literature sources for which are adduced, the paper reports the observation of a similar high-intensity region by the gas-discharge-type counter telescope employed in the Sputnik-2 flight on 20 August 1960 at 0740 GCT. The increase was observed during a period when the Sputnik (S) was in the northern hemisphere at a geomagnetic latitude of 50-60°. This "northern anomaly" was

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ACCESSION NR: AT3006860

observed only on a single pass of the S (Fig. 1 shows the change in counting rate of the telescope on that and adjacent passes). The briefness of the growth in intensity could possibly be attributed partly to statistical fluctuations. However, the increase in the counting rate of the telescope that cannot be attributed to fluctuations alone is also of the order of 3-4 min. The extremely abrupt character of the change in counting rate can be attributed either to an actual fast change of the intensity with time or to the passing out of the S from the region in which the particles prevailed. In the first case, the short duration of the "flash" of high intensity indicates an extremely small dispersion of the particle velocities. This can only be the case if the particles have a fairly high energy, that is, they are particles with a velocity close to that of light. From a review of the fairly elevated solar activity on August 19 and 20, 1960, it is concluded that it is reasonable to assume that the counting-rate growth was evoked by a flux of solar protons and nuclei of the intermediate group generated during a chromospheric flare-up. The relatively weak increase in intensity of the nuclei of the intermediate group can be explained by the elevated energy threshold of the Cherenkov counter. The incident related suggests that it is important, at this time, to obtain long-term observations of cosmic radiation outside of the Earth's atmosphere, wherein the measurements must be constructed in such a way that changes in the intensity of the protons and various groups of nuclei over a broad energy range can be obtained. Orig. art. has

Card 2/4

s/269/63/000/003/007/036  
A001/A101

AUTHORS: Ginzburg, V., Kurnosova, L., Razorenov, L., Fradkin, M.

TITLE: An orbital laboratory. Some outer space studies by means of satellites and rockets

PERIODICAL: Referativnyy zhurnal, Astronomiya, no. 3, 1963, 25, abstract 3.51.204 ("Aviatsiya i kosmonavtika", 1962, no. 6, 13 - 22)

TEXT: The authors present principal results of studying primary cosmic rays, obtained by means of satellites and rockets, and the tasks of further investigations. It has been established, by means of Cherenkov counters, that abundance of lithium, beryllium and boron in cosmic rays exceeds hundred-fold that expected; it follows thereof, that cosmic rays passed a layer of interstellar gas during their path in the solar system. The spectrum of all nuclei is independent of the ordinal number in Mendeleyev's table; the flux of nuclei with numbers greater than 30 is less than the flux of nuclei with numbers greater than 15 by a factor of at least 10,000. The second space rocket launched towards the Moon and the third space ship recorded a sharp increase of the number of nuclei

Card 1/2

An orbital laboratory. Some outer...

S/269/63/000/003/007/036  
A001/A101

with atomic numbers 15 and higher. It is assumed that the nuclei recorded are of solar origin, which is confirmed by the analysis of data on other manifestations of solar activity during the same time. Earth's radiation belts were discovered. The lower part of the radiation belts attains an altitude of ~ 200 km, although the belts are clearly pronounced only at higher altitudes (600 - 1,000 km and higher). It was discovered that radiation belts have "spurs", the lower of which are related to magnetic anomalies. The tasks of further investigations are studying Earth's radiation belts, the proton component of galactic and solar cosmic rays, "high-latitude cut-off" in the spectrum of cosmic rays, and electronic component of galactic and solar cosmic rays.

T. Kasimenko

[Abstracter's note: Complete translation]

Card 2/2



KURNOSOVA, L.V.; RAZORENOV, L.A.; FRADKIN, M.I.

Increase of short duration in radiation intensity recorded  
August 20, 1960, during the flight of the second spaceship-  
satellite. Isk.sput.Zem. no.15:66-70 '63. (MIRA 16:4)  
(Artificial satellites) (Solar radiation—Observations)

13982  
S/560/62/000/012/002/014  
1063/1263

8.1150

AUTHORS:

Kurnosova, L.V., Logachev, V.I., Razorenov, L.A. and  
Fradkin, M.I.

TITLE:

Energetic spectra of different nuclear groups of the  
cosmic radiation as measured by Cherenkov detectors  
in ship-satellites

PERIODICAL:

Akademiya nauk SSSR. Iskusstvennyye sputniki Zemli  
no.12, 1962, Moscow, 16-30

TEXT:

The energetic spectra of different nuclear groups within  
the range of  $10^9 - 10^{10}$  eV/nucleon were investigated in the second  
and third Soviet space ship-satellites. In the former three indepen-  
dently functioning Cherenkov detectors were used: one of the integ-  
ral type recorded nuclei with charges  $Z \geq 5$ ,  $Z \geq 15$ , and  $Z \geq 34$  and  
two detectors of the differential type recorded the charge of nuclei

X

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S/560/62/000/012/002/014  
I063/I263

Energetic spectra of different nuclear....

from helium up to oxygen. The directions of the nuclei were determined by a cosmic-ray telescope. Similar instruments in the third ship-satellite recorded nuclei with the following charges:  $Z \geq 5$ ,  $Z \geq 12 - 14$ ,  $Z \geq 31 - 34$  and  $Z > 34$ . The intensity of each nuclear group was measured within the geographical latitude range of  $-65^\circ$  to  $+65^\circ$ . Considering the low-energy limit of charged particles arriving vertically at each geomagnetic latitude the integral spectra of the nuclear groups were deduced from flux measurements at the different geomagnetic latitudes. Each spectrum represented an average of both identical plus and minus latitudes. The dependence of the flux of nuclei with  $Z \geq 2$ ,  $Z \geq 4 - 5$  and  $Z \geq 12 - 14$  on the latitude as measured in the third ship-satellite was similar within the experimental error. An increase of the flux with latitude was observed for latitudes from  $0^\circ$  up to  $45^\circ$ , thereafter the flux remained practically constant. The integral energetic spectra of the different

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S/560/62/000/012/002/014  
I063/I236

Energetic spectra of different nuclear... nuclear groups showed the same behavior. The low-energy cutoff of the particles was observed to occur at 45° latitude instead of 50°-55° (high-latitude cutoff). This is explained by the energy threshold of the detectors. (2.2 beV/nucleon). The integral spectra for energies higher than the threshold value were assumed to be represented by a power function. The power-index of each group was measured from the slope of the straight line obtained when the flux was plotted against the energy per nucleon in a double logarithmic scale. No significant difference was observed between the power-indices for nuclear groups having  $Z \geq 2$ ,  $Z \geq 4 - 5$ ,  $Z \geq 12 - 14$  as measured in the third ship-satellite. The value of the power-index of nuclei with  $Z \geq 15$  as measured in the second ship-satellite was somewhat higher than the values of the other nuclear groups, but, as there is not sufficient data for statistical analysis in this group, no conclusions can be made about its spectrum. There are 8 figures and 7 tables. X

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GINZBURG, V.L.; KURNOSOVA, L.V.; RAZORENOV, L.A.; FRADKIN, M.I.

Some investigations of the nuclear component of cosmic rays  
and radiation belts of the earth carried out by Soviet satellites  
and rockets; survey. Geomag. i aer. 2 no.2:193-232 Mr-Ap '62.  
(MIRA 15:6)

(Cosmic rays)

S/560/62/000/012/003/014  
I063/I263

A case of a short-term increase...

nuclei with total energy higher than 1.4 - 1.5 beV/nucleon were detected. All the measurements were carried out at latitudes higher than 50°, thus the recorded mean intensity of the nuclear component of the cosmic radiation was practically independent of this factor. On December 1st, 1960, an increase in intensity, lasting about 12 min was observed between latitudes 50-70°. The intensity of nuclei with  $Z \geq 12 \div 14$  increased up to  $2.8 \pm 1.4$  times its mean value; no significant increase was observed for nuclei with  $Z \geq 5$  and  $Z \geq 2$ . For the first half of the same period the increase was significant also for nuclei with  $Z \geq 2$  ( $2.7 \pm 1.3$  times the mean value). Nuclei with  $Z \geq 34$  showed an increased intensity simultaneously with that of the lighter nuclei. Similar results were obtained from the second Soviet cosmic rocket (Kurnosova, L.V., Razorenov, L.A., Fradkin, M.I., Akademiya nauk SSSR, *Iskusstvennyye sputniki Zemli*, no.6, 1961, 132).

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S/560/62/000/012/003/014  
I063/I263

A case of a short-term increase...

Simultaneously with this nuclear intensity increase, an outburst in the solar chromosphere of the  $1^+$  class was observed, as well as an increase of the solar radio emission at the frequency of 208 Mc.. The concurrence of these events suggests that relativistic nuclei are generated on the sun. The increased intensity of nuclei with  $Z \geq 12$  could be the result of a preferential acceleration of the heavier nuclei, whereas the higher number of the  $\alpha$  particles may be explained by the relatively high abundance of helium in the sun, so that a large number of these particles are involved in the acceleration process. There is 1 figure. The English-language reference is: C.E.Fichtel, D.E.Guss, Phys. Rev. Lett., 6, 1961, 495. X

SUBMITTED: September 12, 1961

Card 3/3

KURNOSOVA, I. V., LOGACHEV, V. I., RAZORENOV, L. A. and FRADKIN, M. I.

"Observation of the Radiation Anomalies at the Altitudes of 200-300 km"

Report presented at the International Conference on Cosmic Rays  
and Earth Storm, 4-15 Sep 61, Kyoto, Japan.



KURNOSOVA, L.V.; LOGACHEV, V.I.; RAZORENOV, L.A.; FRADKIN, M.I.

Energy spectra of different groups of cosmic ray nuclei measured  
by Cherenkov counters on spaceships. Isk.sput.Zem. no.12:16-30  
'62. (MIRA 15:8)  
(Cosmic rays--Spectra) (Space vehicles--Electric equipment)

KURNOSOVA, L.V.; RAZORENOV, L.A.; FRADKIN, M.I.

Short-time increase in heavy-nuclei intensity during the flight  
of the third spaceship. Isk.sput.Zem. no.12:31-34 '62.

(MIRA 15:8)

(Cosmic rays) (Space vehicles--Electric equipment)

42126

3,2410  
3,2476

S/203/62/002/002/001/017  
1046/1246

AUTHORS: Ginzburg, V. L., Kurnosova, L. V., Razorenov, L. A., and Fradkin, M. I.

TITLE: Some investigations of the cosmic ray nuclear component and of the radiation belts of the earth on Soviet satellites and rockets. Review.

PERIODICAL: Geomagnetizm i aeronomiya, v. 2, no. 2, 1962, 193-232

TEXT: 1) Measurements on groups of nuclei with  $Z \geq 2$ ,  $Z \geq 5$ ,  $Z \geq 12$  to 14,  $Z \geq 15$ ,  $Z \geq 28$  to 30, and estimates of the relative intensity of the stream of very heavy nuclei ( $Z > 30$ ) indicate that the nuclear component of cosmic rays drops very sharply in intensity from  $Z \geq 28$  to  $Z > 30$ . 2) The nuclear-component intensity increases in correlation with the solar activity; at energies  $E 10^9$  eV, some selective acceleration mechanism on the sun accelerates preferably the heavier nuclei. 3) Measurements of the latitudinal effect show that, at energies between  $\sim 1.8$  and  $7.5$  BeV/nucleon, the energy spectra are identical for groups of nuclei with  $Z \geq 2$ ,  $Z \geq 5$ ,  $Z \geq 12$  to 14 (differences in spectral indices do not exceed 10 to 20%). 4) The charge spectra of nuclei indicate that the ratio of the Li, Be, B nuclear group to the  $Z \geq 6$  group is  $53 \pm 15\%$ . 5) The intensity maximum of the outer radiation belt shifted  $10^4$  km towards the surface of the earth during the time interval between the launchings of orbital spaceships I and II (from January to September, 1959).

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Some investigations of the cosmic ray...

S/203/62/002/001/017

1046/1246

6) At altitudes of 200 to 300 km in the 65N to 65S belt the radiation count is in excess of what could have been expected from primary cosmic rays; on the equator, the global radiation intensity is 6 to 7 times as high as the cosmic ray intensity. This phenomenon remains still unexplained 7) Two radiation-intensity anomalies were discovered, viz., the South-Atlantic anomaly at an altitude of 340 km and the Southern anomaly at 194 to 340 km above the Antarctic coast, both being closely associated with the geomagnetic anomalies. In August and December 1960, the lower boundary of the South-Atlantic anomaly was mapped at an altitude of 265 to 306 km. There are 15 figures, 7 tables and 70 references.

✓

Card 2/2

VEPRIN, Ya.M.; KURDOSOVA, I.V.; RAZORENOV, L.A.; TOISTOV, K.D.; FRADKIN, M.I.;  
CHUPIN, V.S.

Experience in the development photographic emulsion layers on the  
second spaceship. Isk.sput.Zem. no.11:35-41 '61. (MIRA 15:1)  
(Spaceships) (Photography, Particle track)

DRAGUN, G.S.; KURNOSOVA, L.V.; LOGACHEV, V.I.; RAZORENOV, L.A.; SIROTKIN,  
I.A.; FRADKIN, M.I.

Equipment for investigating the nuclear component of cosmic rays  
used on space rockets and artificial earth satellites. Isk.sput.-  
Zem. no.9:86-110 '61. (MIRA 14:11)  
(Artificial satellites--Radio observations) (Cosmic rays)

3100

S/048/62/026/006/014/020  
B125/B102

3.2420

AUTHORS:

Ginzburg, V. L., Kurnosova, L. V., Logachev, V. I.,  
Razorenov, L. A., and Fradkin, M. I.

TITLE:

Temporary increases in the intensity of the nuclear cosmic-ray component induced by solar activity and investigation of the radiation intensity at altitudes from 200 to 300 km

PERIODICAL:

Akademiya nauk SSSR. Izvestiya. Seriya fizicheskaya, v. 26,  
no. 6, 1962, 782-798

TEXT: During the flight of the second Soviet space rocket more than 100 nuclei of  $Z \geq 15$ , more than 3000 of  $Z \geq 5$  and more than 30,000 of  $Z \geq 2$  were measured by means of two Cherenkov counters working independently. On the second and third Soviet space ships a current of charged particles was measured by a telescope consisting of gas-discharge counters at altitudes between 187 and 339 km, in latitudes ranging from  $-65^\circ$  to  $+65^\circ$ . Variation in number of heavy nuclei with  $Z \geq 15$  was considerable but that of  $\alpha$ -particles was smaller. At altitudes from 187 to 339 km the counting rate of the telescope was several times greater than otherwise by reason

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the Academy of

S/048/62/026/006/014/020  
B125/B102

Temporary increases in the ...

of the solar activity. On the equator, at an altitude from 306 to 339 km, the global intensity is 1.36 and in higher latitudes 3.3 particles  $\text{cm}^{-2} \text{sec}^{-1}$ . The charged-particle flux intensity of the anomalies in the southern part of the Atlantic Ocean exceeds that in the corresponding geomagnetic latitudes by two orders of magnitude. In 330 km an area of smaller intensity separates the South Atlantic Anomaly (a "sleeve" of the inner radiation belt) from the Southern Anomaly connected with the outer radiation belt. The particles recorded in the equatorial area are protons of at least 60 Mev or electrons of at least 8 Mev. There are obviously very many particles of smaller energy in the anomalies. The line of the smallest radiation intensity lies in an altitude from 187 to 339 km and on the western hemisphere farther south than the geometrical equator. In higher latitudes, owing to solar activity, the intensity of particle currents is subject to considerable temporal variations. The actual mechanism of acceleration and ejection of heavy particles on the sun is not known hitherto. There are 12 figures and 2 tables.

ASSOCIATION: Fizicheskii institut im. P. N. Lebedeva Akademii nauk SSSR  
(Physics Institute imeni P. N. Lebedev of the Academy of  
Sciences USSR)

Card 2/5



RAZORENOV, L. A., FRADKIN, M.I., TOLSTOV, K.D., VEPRIK (fnu), KURNOSOVA, L.V., CHUKIN (fnu)

"Controlled exposition of nuclear emulsions on sputniks"

Fourth International Colloquium on Photography (Corpuscular) - Munich,  
West Germany, 3-8 Sep 62

GINZBURG, V.L.; KURNOSOVA, L.V.; LOGACHEV, V.I.; RAZORENOV, L.A.; SIROTKIN,  
I.A.; FRADKIN, M.I.

Investigating the intensity of charged particles during the flights  
of the second and third artificial satellites. Isk.sput.2em. no.10:  
22-23 '61. (MIRA 14:11)

(Artificial satellites) (Radiation--Measurement)

37199  
S/560/61/000/011/005/012  
EO32/E514

3.2100 (also 4303)

AUTHORS:

Veprik, Ya.M., Kurnosova, L.V., Razorenov, L.A.,  
Tolstov, K.D., Fradkin, M.I. and Chukin, V.S.

TITLE:

Experiment on the development of photographic  
emulsions on board the second cosmic spaceship

SOURCE:

Akademiya nauk SSSR. Iskusstvennyye sputniki Zemli.  
no.11. Moscow, 1961. Rezul'taty nauchnykh  
issledovaniy, provedennykh vo vremya poletov vtorogo  
i tret'yego kosmicheskikh korabley-sputnikov, 55-41

TEXT:

The second Soviet cosmic spaceship carried stacks  
of thick nuclear emulsions. Owing to the fact that the spaceship  
remained in orbit for a considerable time, the number of particles  
recorded in the emulsions was very large, which could complicate  
subsequent scanning and identification of particle tracks. It was,  
therefore, necessary to develop the emulsions before too many  
particles had been recorded. An account is given in the present  
paper of how the emulsions were in fact developed on board the  
spaceship. The operation was carried out in four stages, namely:  
1) exposure of the emulsions to the radiations for a given time,

Card (1/2)

Experiment on the development ... S/560/61/000/011/005/012  
E032/E514

2) development, 3) storage of the emulsions (latent-image centres produced during this period could not be developed), 4) subsequent laboratory analysis on the Earth's surface. The whole operation was carried out in a hermetically sealed container. The emulsion stack (20 unbacked emulsions 300  $\mu$  thick each) had to be so arranged that after the exposure the emulsions could be separated from each other and the developer let in. This was done by a piston device (a schematic drawing of the latter is reproduced). After this operation the developer was removed and a stopping solution was introduced. The emulsions remained in this solution until they were returned to the laboratory for final treatment. It was found that relativistic tracks were easily visible in these emulsions, although the sensitivity to the latter turned out to be somewhat lower than usual. Two particle-track microphotographs are reproduced to illustrate the possibilities of the method. There are 3 figures.

SUBMITTED: July 7, 1961

Card 2/2

32285

S/169/61/000/011/060/065  
D228/2304

17 1400

AUTHORS: Kurnosova, L.V., Logachev, V.I., Kolobyanina, T.N.,  
Razorenov, L.A., Sirotkin, I.A., and Pradkin, M.I.

TITLE: Discovery of radiation anomalies over the Atlantic  
Ocean's southern part at heights of 310 - 340 km

PERIODICAL: Referativnyy zhurnal, Geofizika, no. 11, 1961, 11,  
abstract 11697 (V sb. Iskusstv. sputniki Zemli, no. 8,  
M., AN SSSR, 1961, 90 - 93)

TEXT: By means of apparatus placed aboard the second satellite the  
flow of particles exceeding the flow of cosmic rays was recorded.  
Near the equator the mean flow equalled 1.2 particles  $\text{cm}^{-2} \text{sec}^{-1}$ ,  
being 3.3 particles  $\text{cm}^{-2} \text{sec}^{-1}$  in high latitudes. Regions with an  
anomalously high radiation intensity include the area of the Atlan-  
tic Ocean's southern part ( $25^{\circ}$  and  $50^{\circ}\text{S}$ ,  $0^{\circ}$  and  $55^{\circ}\text{W}$ ). A Southern  
anomaly, situated between  $50 - 65^{\circ}\text{S}$  and  $30^{\circ}\text{W} - 40^{\circ}\text{E}$ , was detected  
at a height of 340 km. An increase in the intensity was recorded in  
the northern hemisphere in the area  $60 - 65^{\circ}\text{N}$  and  $130 - 170^{\circ}\text{E}$ . This

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32235

Discovery of radiation anomalies ...

S/169/61/000/011/060/065  
D228/D404

anomaly was only observed on one orbit of the satellite's trajectory. is unstable in time and is possibly related to the outer radiation belt. In the authors' opinion the South Atlantic and Southern anomalies are connected with the existence of large negative magnetic-anomalies in the southern hemisphere, i.e. regions in which the magnetic field-strength is less than the normal intensity for the given geomagnetic latitude. [Abstractor's note: Complete translation]. X

Card 2/2

*RAZORENOV, L. A.*

32719

S/560/61/000/009/009/009  
D045/D114

9.6150

21 6000

AUTHORS: Dragun, G. S., Kurnosova, L. V., Logachev, V. I., Razorenov, L. A.,  
Sirotkin, I. A., and Fradkin, M. I.

TITLE: Equipment for investigating the nuclear components of cosmic rays  
installed on space rockets and artificial earth satellites

SOURCE: Akademiya nauk SSSR. Iskusstvennyye sputniki Zemli, No. 9,  
Moscow, 1961, 86-110

TEXT: Equipment installed on the third Soviet artificial Earth satellite  
and on space rockets, for investigating the nuclear components of cosmic  
rays, is described. The results of the measurements carried out with the  
aid of the described devices have already been published in previous issues  
of the journal. All the devices consist of the following basic elements:  
a charged particle detector (integral Cherenkov counter); an electronic  
system for amplifying signals, for selecting the required ionizing events and  
for storing them; and elements for matching the photomultiplier output with  
the input of the electronic circuit and the output of this circuit with the  
radiotelemetric system. A block diagram of a unit for recording the nuclei

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32719

S/560/61/000/009/009/009  
D045/D114

Equipment for investigating the ...

of cosmic rays is given in fig. 1. The Cherenkov counter can be used for investigating temporary changes in the intensity of the nuclear component and the dependence of this intensity on distance from the Earth. The advantages of the counter are that the radiotechnical device used is relatively simple and that a sufficiently large number of particles can be registered per unit of time. The disadvantage of its use is that the quantity of light, divided in the detector, and the number of photoelectrons taken from the cathode of the photomultiplier is small, and consequently the value of the output pulse is small and large statistical fluctuations occur. A device for measuring the characteristics of Cherenkov counters and several aspects of calibration are described and illustrated. It is stated that the instruments for measuring the nuclear components of cosmic radiation installed on the first and second space rockets had an additional channel designed for registering radiation in an area of increased radiation intensity. A sharp increase in intensity was observed at distances of  $27 \cdot 10^3$  km (first rocket) and  $17 \cdot 10^3$  km (second rocket) in an area later called the inner radiation belt. A block diagram of one version of the electronic system is shown in fig. 17. As can be seen from the figure, information on the condition of

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S/560/61/000/009/009/009  
D045/D114

Equipment for investigating the ...

the triggers of the accumulating system can be transmitted through the radiotelemetric system. The following parts of the radio system are described and illustrated: emitter follower; flip-flop-cells; and summation cells. The described parts were used in designing devices for measuring nuclei beyond the edge of the atmosphere; depending on the problems set and the actual conditions, a final selection of the parameters was made and essential changes in individual elements carried out. Two diagrams are included showing the arrangement of devices for registering nuclei with (1)  $Z \geq 5$  and  $Z \geq 15$ , and (2)  $Z \geq 2$ . The authors thank radio technician V. Marevskiy, laboratory worker V. Razhin and designer G. Yegorov for their cooperation. There are 29 figures and 7 Soviet references.

SUBMITTED: April 17, 1961

Card 3/43

12420(1482, 2806, 1049)

17 2400

33305

S/560/61/000/010/003/016

D299/D302

AUTHORS:

Ginzburg, V. L., Kurnosova, L. V., Logachev, V. I., Razorenov, L. A., Sirotkin, I. A., and Fradkin, M. I.

TITLE:

Study of charged-particle intensity during the flight of the 2nd and 3rd Sputniks

SOURCE:

Akademiya nauk SSSR. Iskusstvennyye sputniki Zemli. no. 10. Moscow, 1961, 22-33

TEXT:

During the flight of the 2nd and 3rd Sputniks, the flow of charged particles at altitudes between 187 and 339 km and latitudes of  $-65^{\circ}$  to  $+65^{\circ}$  was recorded by means of a telescope consisting of 2 rows of gas-discharge counters; the telescope was part of measuring equipment for cosmic rays. As a result of the measurements, the intensity of the charged particles and its latitude dependence were determined. The counting rate  $N_c$  and

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33305

S/560/61/000/010/003/016

D299/D302

Study of charged-particles...

the global intensity  $J_{gl}$  at various latitudes are listed in a table. It was found that at all latitudes the recorded intensity was several times higher than the intensity of cosmic rays recorded in the stratosphere and in free space beyond the earth's magnetic field. This difference is particularly noticeable in the region of the geomagnetic equator, where the measured intensity was six times that of cosmic rays. Several regional anomalies of intensity were observed, apparently related to the anomalies of the earth's magnetic field. For the entire track of the space-ships, detailed graphs were made of the time dependence of the intensity and hence of its dependence on geographical coordinates and altitude of the space-ship. From these graphs, maps were made of the intensity distribution on the earth's surface. It is noted that, with repeated passage of the space-ship above the same terrestrial point and almost same altitude, the recorded intensity differed sometimes from that on the first passage; in some cases, the intensity was almost double. This difference

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2

33305

S/560/61/000/010/003/016

D299/D302

Study of charged-particles...

was particularly noticeable at high latitudes. As the orientation of the apparatus changes during the second passage, this difference in intensity may not be real. The obtained equi-intensity lines for the south-Atlantic and southern anomalies constitute a slight refinement to the earlier obtained data (in the references); the maximum number of counts in the southern anomaly was 60 per second, and in the south-Atlantic anomaly it was 70 per second. The anomalies are particularly great in the Southern Hemisphere. The intensity distributions in the anomaly regions, recorded at altitudes of 306 - 339 km and at altitudes of 187 - 265 km during the two flights, differ from each other. This difference is apparently due to the different flight-altitudes. The connection between the anomalous structure of the radiation belts and the anomalies of the earth's magnetic field is evident; it would be premature, however, to assume that the regional anomalies of the magnetic field on the earth's surface have a substantial influence on charged-particle flow up to altitudes of 200 - 300 km. The many anomalies in the South- and

X

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2

33305

S/560/61/000/010/003/016  
D299/D302

Study of charged-particles...

North-Pole regions, their disposition and variation, suggest that these anomalies are the edges of the outer radiation belt of the earth. The latitude dependence of the intensity is shown in a graph (for the Northern Hemisphere); it is noted that, at high latitudes, the increase in intensity ceases. The obtained data on the intensity distribution give evidence of the edge effects of the radiation belts at 200 - 300 km altitude and of certain peculiar features not observed previously. In particular, the great temporal anomalies are noted; thus, the "northern anomaly" recorded on August 20, 1960, at 7 hr. 40 min. (world time) and the south-polar anomaly recorded on December 1, 1960, at 14 hr. 22 min. These anomalies are apparently due to solar activity. The line of least intensity (the "radiation equator") is shown in a figure. With regard to the composition of the radiation, it is likely that the increase in the counting rate (as compared to that from primary cosmic rays) is due to protons with  $E_p > 60$  Mev; although no definite conclusion is possible as yet, it

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33305

S/560/61/000/010/003/016  
D299/D302

Study of charged-particles...

is assumed (as a working model) that the inner radiation belt is formed by protons and that the number of electrons of energies higher than  $\sim 2$  Mev is small. The above results confirm the existence of a high-intensity region down to 200 km altitude (from 1000 km). On the other hand, the radiation at 50 - 150 km is practically independent of altitude. The altitude dependence of the intensity (for 200 - 2000 km) is shown in a figure. Tentatively, the altitude  $h$  and the atmospheric density  $\rho$  can be expressed by the values:

$h$ , km	100	150	200	300	400	500
$\rho$ , $\text{gm} \cdot \text{cm}^{-3}$	$10^{-9}$	$10^{-11}$	$10^{-12}$	$10^{-13}$	$2 \times 10^{-14}$	$2 \times 10^{-15}$
$h$ , km	600	700	800	900	1000	
$\rho$ , $\text{gm} \cdot \text{cm}^{-3}$	$6 \times 10^{-16}$	$2 \times 10^{-16}$	$6 \times 10^{-17}$	$3 \times 10^{-17}$	$10^{-17}$	

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S/560/61/000/010/003/016  
D299/D302

Study of charged-particles...

On the basis of the incomplete data available, the internal radiation-belt in the equatorial region for altitudes above 400 - 600 km can be approximated by a very simple model, where only ionization losses are taken into account. At higher latitudes, the pattern is more complicated; it becomes necessary to render more precise the composition, spectrum and altitude-variation of the charged particles. At altitudes below 400 - 600 km,

considerable deviations from the formula  $J \sim p^{-1}$  occur. This is due to diffusion of the particles in a direction transverse to the magnetic field; this diffusion mechanism is related to collisions between particles. A second diffusion mechanism exists, related to the presence of electric fields  $E$  which cause particle-drift. The diffusion processes require further investigation. Finally, the radiation dose is estimated beneath a layer of matter of the order of  $4 \text{ gm/cm}^{-2}$  at an altitude of 200 - 300 km. Assuming recorded proton energies (in the equa-

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Study of charged-particles...

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D299/D302

torial region) of  $E_p \geq 60$  Mev, the daily radiation dose constitutes approximately 30% of the permissible dose. In the region of the south-Atlantic anomaly at 300 km altitude, the radiation dose is by an order of magnitude higher than at the equator. There are 10 figures, 1 table and 10 references: 7 Soviet-bloc and 3 non-Soviet-bloc (including 2 translations). The reference to the English-language publication reads as follows: S. Yoshida, G. H. Ludwig, J. A. Van Allen, J. Geophys. Res., 65, 807, 1960.

SUBMITTED: May 15, 1961

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32286

17 2400

S/169/61/000/011/061/005  
D228/D304

AUTHORS: Kurnosova, L.V., Razorenov, L.A., and Fradkin, M.I.  
TITLE: Investigating the nuclear component of cosmic rays  
on the third cosmic rocket  
PERIODICAL: Referativnyy zhurnal. Geofizika, no. 11, 1961, 11-12,  
abstract 11G98 (V sb. Iskusstv. sputniki Zemli, no. 8,  
M., AN SSSR, 1961, 87 - 89)

TEXT: Measurements of the nuclear component of cosmic rays on the  
third cosmic rocket were made by means of a Cherenkov counter. The  
flow of nuclei with charges  $Z \geq 2$ , 14 - 15, and 28 - 30 was recor-  
ded. The mean intensity of nuclei for the whole measurement period  
amounted to  $10.3 \pm 0.2$  ( $Z \geq 2$ ),  $0.09 \pm 0.02$  ( $Z \geq 14 - 15$ ) and  $0.013$   
 $\pm 0.01$  ( $Z \geq 28 - 30$ ). In contrast to the readings of the second cos-  
mic rocket which registered an increased count of nuclei with  $Z \geq 2$   
at a distance of  $\geq 10^4$  km from the earth's center, the counter of  
the third cosmic rocket did not detect any increase in the count  
rate of nuclei with  $Z \geq 2$  at a distance of  $1.5 \times 10^4$  km (the thre-

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32286

Investigating the nuclear component ... S/169/61/000/011/061/065  
D228/D304

shold value of the amplitude on the third rocket was increased by two-fold and equalled the mean magnitude of the impulse from  $\alpha$ -particles). For the flow of nuclei with  $Z \geq 14 - 15$  a value of 0.4 - 0.5 particles  $m^{-2}sec^{-1}$  steradians $^{-1}$  was obtained which agrees with the results of measurements on the second cosmic rocket. The flow of nuclei with  $Z \geq 28 - 30$  amounted to  $\sim 0.1$  particles  $m^{-2}sec^{-1}$  steradians $^{-1}$ . This value is considerably greater than the one measured on the third satellite (for  $Z \geq 30 - 40$ ), which is, apparently, explained by the change in the recording threshold. [Abstractor's note: Complete translation]

Card 2/2

89690

S/026/61/000/001/007/007

A166/A027

9.9100 (also 1046, 1060)  
3.1800 (1041, 1062, 1178)

AUTHORS: Kurnosova, L.V., Razorenov, L.A., and Fradkin, M.I.,  
Candidates of Physics and Mathematics

TITLE: The Sun's Cosmic Radiation

PERIODICAL: Priroda, 1961, No. 1, pp. 94-96

TEXT: The article lists some results of studies of the sun's primary radiation. On 12 September 1959 the Gerenkov counters on board the second Soviet space rocket recorded an 11.8-fold increase in the number of atomic nuclei with an atomic number  $Z \geq 15$ . The increase lasted for 17 minutes, after which the counters registered a normal radiation intensity. At the same time the incidence of nuclei with  $Z \geq 2$  and  $Z \geq 5$  increased by approximately only 1.3 and 1.5-fold respectively. Analysis showed that the rise in  $Z \geq 5$  nuclei was due almost entirely to the increase in nuclei with  $Z \geq 15$ . The probability that this phenomenon was a statistical fluctuation is in the order of 1:100,000. At the same time ground stations on earth recorded radio-frequency emission flares. The Krakovskaya observatoriya (Krakov Observatory) noted a brief flare at 810 Megacycles lasting for 0.3

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The Sun's Cosmic Radiation

S/026/61/000/001/007/007  
A166/A027

minute. The probability that the two phenomena are coincidental is less than one percent. On the same day at 1137 hr. the observatory of the Institut zemnogo magnetizma (Institute of Geomagnetism) near Moscow noted a solar radio flare at 208 Megacycles and an intensity of  $170 \cdot 10^{-22}$  watt meter<sup>-2</sup> cycle<sup>-1</sup>, compared to an average intensity in this band from 9-12 hr. of  $15 \cdot 10^{-22}$ . Two further instances of increased nuclear activity ( $Z \geq 15$ ) were recorded on the same day at 1257 and 1523 hr. Indications are that on the sun there occur processes whereby nuclei are accelerated to energies exceeding  $1.5 \cdot 10^9$  ev/nucleon; such processes favor heavy nuclei. Upon leaving the sun the accelerated nuclei flow as compact groups in space. There are 5 graphs and 1 photo.

ASSOCIATION: Fizicheskii institut im. P.N. Lebedeva AN SSSR (Physical Institute im. P.N. Lebedev, AS USSR), Moscow

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82 LORENOV, L. A., FIVADKIN, M. I., JENEBORG, V. L., KOSHELOVA, L. A.

"The results of measurements of nuclear component of cosmic rays of solar origin with Sputniks and Luniks."

report to be submitted for the IAU Symposium on the Corona, Cloudcroft, New Mexico, 28-30 Aug 1961.

**PLEASE 1 BOOK EXPLOITATION**

BOV/42612

**Abdennur Dalk Sici**

*Ishnastermyces spumellus* small, var. 5 (Artificial Earth Division, No. 5)  
Moscow, Izd-vo AN SSSR, 75 p. Errata slip inserted. 7,000 copies printed.

Изд. М. и Л. Т. Елизаров; Изд. of Publishing House: М. И. Печкин; Тех. Изд.:  
О. Н. Оульков.

**NOTES:** The booklet is intended for scientists and engineering and scientific personnel working in the field of space travel and satellite flight.

NOTES: The collection of 10 articles deals with problems of satellite orbits, magnetic measurements, radiation, the visibility of space vehicles, the upper atmosphere, and meteoric substances. No personalities are mentioned. References accompany some of the articles.

BOGOMOLOV, S. SM., 19. O. TEROSHENKO, L. N. ZHURGOV, N. Y. RYKHLOV, and  
L. O. SYRMELOV. Magnetic measurements on the second (Boyle's) spin  
isotopes

16

ventor, B. N., A. Ia. Chetaniy, P. V. Vakhov, Yu. I. Logachyov, and A. G. Nikolayev. Radiation Measurement in the Flight of the Second Space Rocket.

24

El'mosova, L. V., V. I. Longchay, L. A. Rastvorov, and M. I. Pruklin.  
Investigation of Cosmic Radiation in the Region of the Second Space  
Route to the Moon

8

HOAGSON, T. H. Results of the investigation of Mescalito substance with the help of instruments mounted in space rockets

3

Brusilovich, B. V., and Ye. B. Tokar'. Some Problems of Control in  
Inertial Space

11

# Stability of the Visibility Conditions of Space

5

ULLERY, A.D. CONTROLS THE PROBLEM OF THE FORMATION OF NO<sup>+</sup> IN THE UPPER ATMOSPHERE

8

Exhibits Ex. 1 - Overview of Nevada from the Third Service  
Additional Exhibits Available from Cape Cod County

8

of the "Aristocracy," as Mr. and O. V. Givens, Chairman of the Board of the American Land Swindle's Revolving Fund, the Action of Internal Politics

72

AVAILABILITY: Library of Congress

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MC/PW/PAL  
11-30-60

KURNOSOVA, L.V.; LOGACHEV, V.I.; RAZORENOV, L.A.; FRADKIN, M.I.

Studying cosmic rays during the flight of the second cosmic  
rocket to the moon. Isk.sptu.Zem. no.5:30-37 '60.  
(MIRA 13:5)

(Cosmic rays) (Lunar probes)

KURNEKOVA, L.V.; RAZORENOV, D.A.; FRADKIN, M.I.

Heavy nuclei in the primary cosmic radiation. Isk.sput.Zem.  
no.2:70-74 '58. (MIRA 12:5)  
(Artificial satellites)  
(Cosmic rays)



25992  
S/560/61/000/006/010/010  
E032/E114

3.2410

AUTHORS: Kurnosova, L.V., Razorenov, L.A., and Fradkin, M.I.  
TITLE: Short-period increases associated with solar activity  
in the intensity of the nuclear component of cosmic  
rays  
PERIODICAL: Akademiya nauk SSSR. Iskusstvennyye sputniki Zemli.  
No. 6, Moscow, 1961. pp. 132-138  
TEXT: The nuclear component of cosmic rays was investigated  
with an apparatus set up on the second Soviet space rocket. This  
apparatus was described by the present authors and V.I. Logachev  
in Ref.1 (same journal, No.5, izd-vo AN SSSR, 1960, p.30) and  
consisted of two independent Cherenkov counters which recorded  
nuclei moving with relativistic velocities. During the flight of  
the rocket the number of recorded nuclei with  $Z \geq 15$ , 5 and 2 was  
100, 3000 and approximately 30 000 respectively. The counting  
rates, averaged over long periods of time, were found to be  
practically constant after the rocket left the outer radiation  
belt. However, sudden departures of the counting rate from the  
average value were noted over short time intervals. The most  
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E032/E114

Short-period increases associated with..

pronounced of these cases of sudden increase in the intensity of the nuclear component was recorded on September 12 at 11 h 27 min UT. In this case the counting rate of both detectors showed an increase which continued for approximately 17 min. This case is illustrated in Fig.1 which shows the intensities of the various groups of nuclei as functions of time. The first three graphs show the intensity of nuclei with  $Z \geq 2, 5$  and  $15$  respectively (the intensity is plotted in particle/min along the vertical axis and the time along the horizontal axis). The fourth figure shows a graphical representation of chromospheric flares. They are represented by triangles whose bases correspond to the interval between the beginning and the end of the flare and whose apexes indicate the position of the maximum brightness of the flare. The fifth graph shows the average intensity of the solar radio emission on 810 Mc/s and the last graph shows the solar radio emission on 208 Mc/s (the intensity is plotted in  $\text{wm}^{-2}\text{cps}^{-1} \times 10^{22}$ ). Other similar changes in the intensity of the nuclear component were also recorded, for example, on September 12 at 12 h 57 min and at 15 h 23 min on the same day. Statistical analysis of these results leads the present authors to conclude that these rapid increases

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E032/E114

Short-period increases associated ....

in the intensity of the nuclear component are real and appear to be associated with solar activity. A somewhat similar effect has been reported by H.R. Anderson (Ref.5: Phys. Rev., V.116, 461, 1959), who noted short-period increases in the total intensity of cosmic rays. The variations in the nuclear component are characterized by the fact that the most clearly defined changes occur in the intensity of the heavy nuclei. The present authors suggest that it may be that there is some mechanism on the sun whereby nuclei are accelerated to energies in excess of  $1.5 \times 10^9$  ev/nucleon and, apparently, the heavier nuclei are preferentially accelerated. The accelerated nuclei leave the sun and move in space in compact groups. However, in order to establish this, further satellite and space rocket experiments are necessary. Acknowledgments are made to Professor V.L. Ginzburg who directed this work, Professor N.A. Dobrotin and Professor G.T. Zatsepin for discussing the results obtained, and E.I. Mogilevskiy for supplying radio data. There are 3 figures and 8 references: 6 Soviet and 2 English. The English language references read as follows:

Ref.5: as quoted above.

Ref.6: P. Meyer, Phys. Rev., V.115, 1734, 1959.

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KURNOSOVA, L.V.; KOLOBYANINA, T.N.; LOGACHEV, V.I.; RAZORENOV, L.A.; SIROTKIN,  
I.A.; FRADKIN, M.I.

Detecting radiation anomalies above the southern part of the  
Atlantic Ocean at altitudes from 310 to 340 km. Isk.sput.Zem.  
no.8:90-93 '61. (MIRA 14:6)  
(Artificial satellites) (Cosmic rays)

KURNOSOVA, L.V.; LOGACHEV, V.I.; RAZORENOV, L.A.; FRADKIN, M.I.

Radiation effects at a great altitude. Priroda 50 no. 4:86 Apr '61.  
(MIRA 14:4)

(Altai Territory—Coal)

KUMOSOVA, L.V.; NAZARENKO, L.A.; FRADKIN, M.I.

Increases of short duration in the intensity of the nuclear component  
of cosmic rays, connected with solar activity. Isk.sput.Zem. no.6:  
132-138 '61. (MIRA 14:0)

(Cosmic rays)

(Artificial satellites--Moon)

26820  
S/560/61/000/008/009/010  
E032/E514

17.2400

24.6500

AUTHORS:

Kurnosova, L. V., Razorenov, L. A. and Fradkin, M.I.

TITLE:

Investigation of the nuclear component of cosmic rays  
with the third space rocket

PERIODICAL:

Akademiya nauk SSSR, Iskusstvennyye sputniki zemli,  
1961, No.8, pp.87-89

TEXT:

The nuclear component of the primary cosmic rays was investigated with a Cherenkov counter mounted on the third space rocket and was similar to that employed on the second rocket (Ref.1: L. V. Kurnosova, V. I. Logachev, L. A. Razorenov and M. I. Fradkin. Iskusstvennyye sputniki Zemli, No.5, izd-vo AN SSSR, 1960, p.30). The counter was placed inside a hermetically sealed container, whose thickness was equivalent to 1 g/cm<sup>2</sup> of aluminium. The screening of the counter by neighbouring instrumentation was roughly the same as in the case of the second space rocket. A record was made of nuclei with charges greater than or equal to 2, 14-15 and 28-30. The average number of counts in the  $Z \geq 2$ ,  $Z \geq 14-15$  and  $Z \geq 28-30$  channels was found to be  $10.3 \pm 0.2$ ,  $0.09 \pm 0.02$  and  $0.013 \pm 0.001$  per min, respectively. Analysis of the

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Investigation of the nuclear

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E032/E514

results obtained in the  $Z \gg 2$  channel did not resolve the problem as to why there was an enhanced counting rate in the  $\alpha$ -particle channel, which was observed with the second rocket between 10 000 and 30 000 km from the Earth's centre. The number of counts in the  $Z \gg 14-15$  channel is in good agreement with the results obtained with the second space rocket, the corresponding intensity of nuclei in this group being 0.4-0.5 particles  $m^{-2} sec^{-1} sterad^{-1}$ . The corresponding figure for the  $Z \gg 28-30$  channel was found to be  $\sim 0.1$  particles  $m^{-2} sec^{-1} sterad^{-1}$ , which is very much greater than the flux obtained for the  $Z \gg 30-40$  range with the third satellite (Ref.2: L. V. Kurnosova, L. A. Razorenov and M. I. Fradkin. *Iskusstvennyye sputniki Zemli*, No.2, izd-vo AN SSSR, 1958, p.70). This may be due to the fact that the cosmic rays have a large ion component ( $Z \approx 26-28$ ). Acknowledgments are expressed to G. S. Dragun, V. I. Logachev, V. V. Marevskiy, V. D. Razhin, I. A. Sirotkin who took part in the building, adjustment and tests on the instrument. There are 2 Soviet references.

SUBMITTED: December 27, 1960

Card 2/2



26521

S/560/61/000/008/010/010

E032/E514

17.2400

24 6700

AUTHORS:

Kurnosova, L. V., Kolobyanina, T.N., Logachev, V.I.,  
Razorenov, L.A., Sirotkin, I.A. and Fradkin, M.I.

TITLE:

Detection of anomalies in the radiation above the  
southern part of the Atlantic Ocean at altitudes  
between 310-340 km

PERIODICAL:

Akademiya nauk SSSR, Iskusstvennyye sputniki zemli,  
1961, No.8, pp.90-93

TEXT:

The second Soviet satellite carried a counter telescope designed to record the total cosmic ray intensity. This telescope was a part of a more complex device whose function was to record the nuclear cosmic ray component. A brief description of the apparatus was given by S. N. Vernov, V. L. Ginzburg, L. V. Kurnosova, L. A. Razorenov, M. I. Fradkin (Ref.1: UFN, 63, No.1b, 131, 1957). The present paper is concerned only with the anomalously large counting rates obtained while the satellite was passing over certain regions of space. The telescope consisted of two groups of counters with effective areas of 120 and 25 cm<sup>2</sup>. The distance between them was 35.8 cm. The amount of matter between the two groups of counters was about 4 g/cm<sup>2</sup> (largely perspex).

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Detection of anomalies in the ...

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Thus, the telescope recorded electrons with energies  $> 8$  MeV and protons with energies  $> 60$  MeV. The particle flux recorded by the telescope was greater than the cosmic ray flux at all the points where the measurements were recorded. In the region of the equator the average flux was  $1.2 \text{ particle cm}^{-2} \text{ sec}^{-1}$ , while at high altitudes the figure was  $3.3 \text{ particle cm}^{-2} \text{ sec}^{-1}$ . Another unexpected result was the discovery of regions with anomalously large intensities. Among these regions was that above the southern part of the Atlantic Ocean where on August 19, 1960 there was an increase in the counting rate every time the satellite passed through the region. This is indicated by Fig.1 which shows the counting rate as a function of local Moscow time. The three peaks (1,2,3) correspond to the passage of the satellite through the anomaly. The anomaly lies between  $25$  and  $50^\circ \text{ S}$  and  $0$  and  $55^\circ \text{ W}$ . A further anomaly was discovered between  $50$  and  $65^\circ \text{ S}$  and  $30^\circ \text{ W}$  and  $40^\circ \text{ E}$ . A third anomaly was found in the northern hemisphere between  $60$  and  $65^\circ \text{ N}$  and  $137$  and  $170^\circ \text{ E}$ . It is suggested that the northern anomaly may be associated with the outer radiation belt and is affected by solar flares. The South Atlantic and Southern anomalies may be associated with the existence in the southern

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Detection of anomalies in the ...

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E032/E514

hemisphere of large negative magnetic anomalies (Ref.4: B. M. Yanovskiy. Zemnoy magnetizm. M., GTTI, 1953), i.e. regions in which the magnetic field strength is lower than the normal field strength. A. J. Dessler (Ref.5: J. Geoph. Res., 64, 713, 1959) has suggested that negative anomalies may act as sinks for the charged particles in radiation belts. V. L. Ginzburg has pointed out to the present authors that T. D. Carr, A. G. Smith and H. Bollhagen (Ref.6: Phys. Rev. Lett., 5, 418, 1960) have discussed the variation in the intensity of radio-waves of Jupiter and have pointed out that the longitude dependence of this intensity becomes understandable if it is assumed that there are magnetic field anomalies on Jupiter. In such regions the charged particle concentration will be enhanced and there will be an increase in the radio emission. This effect may be analogous to the increase in the intensity of radiation in the region of magnetic anomalies reported in the present paper. Acknowledgments are expressed to Professor V. L. Ginzburg and Professor N. A. Dobrotin for their advice. There are 2 figures and 6 references. 4 Soviet and 2 non-Soviet.

SUBMITTED: December 27, 1960  
Card 3/4

RAZORENOV, L.V.

Blood coagulation in the pleural cavity in noninfected and infected  
hemothorax. Vest. khir. 85 no. 7:45-49 Je '60. (MIRA 14:1)  
(HEMOTHORAX) (BLOOD—COAGULATION)

. GINZBURG, L. V. KURISOVA, V. I. LOGACHEV, L. A. RAZOCHENOV, M. I. PARDY

Primary cosmic radiation investigation.

Report submitted for the 8th Intl. Conf. on Cosmic Rays (IUPAP), Jaipur India,  
2-14 Dec 1963

RAZORENOV, N.G.; FESENKO, P.V., red.; KRASAVINA, A.M., tekhn. red.

[Computing devices and tracking systems] Schetno-reshaiushchie  
ustroistva i slediashchie sistemy. Moskva, Voenn. izd-vo M-va  
oborony SSSR, 1961. 51 p. (MIRA 14:11)  
(Radar) (Electronic calculating machines) (Potentiometer)

L 27241-66

ACC NR: AP6009895

SOURCE CODE: UR/0413/66/000/004/0086/0086

AUTHOR: Razorenov, N. Ye.

ORG: none

TITLE: Beam-splitting device. Class 42, No. 179035

SOURCE: Izobreteniya, promyshlennyye obraztsy, tovarnyye znaki, no. 4, 1966, 86

TOPIC TAGS: light beam splitter, photoelectric pyrometer

ABSTRACT: This Author Certificate presents a beam-splitting device for photo-electric pyrometers,<sup>0</sup> which contains a reflector with a mirror surface. To provide for simultaneous operation in several spectral intervals, the device is in the form of a closed cavity with a reflecting internal surface and two or more holes (see Fig. 1). The light beam from the measured object is focused into one of the holes. The other holes serve as outlets for the light beams.

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UDC: 536.521:621.383:771.449.2

L 27241-66

ACC NR: AP6009895

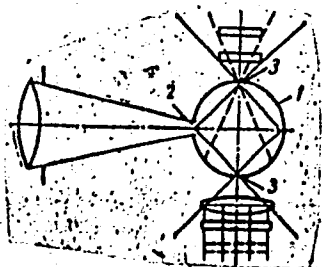


Fig. 1. 1 - sphere with reflecting internal surface; 2 - input hole; 3 - output hole.

Orig. art. has: 1 diagram.

SUB CODE: 20/ SUBM DATE: 22Nov64

Card 2/2 CC



RAZORNOV, N.Ye., inzh.

Automatic control of the temperature of thin tubes with continuous and sequential induction heating in inductors with finite length. Trudy NIITVCH no.4:36-54 '63. (MIRA 17:7)

ACC NR: AP6031653

SOURCE CODE: UR/0416/66/000/009/0024/0026

AUTHOR: Laptev, A. (Major general; Tank forces); Razorenov, S. (Colonel)

ORG: none

TITLE: When tank forces advance

SOURCE: Tyl i snabzheniye sovetskikh vooruzhennykh sil, no. 9, 1966, 24-26

TOPIC TAGS: military operation, armed force logistics, servicing technique, food service equipment, military tank

ABSTRACT: To improve a tank troop advance it is recommended that refueling stations be decentralized and operated at the battalion level, letting the battalion commander decide the time and place for refueling. The officer in charge of repair and maintenance, a deputy battalion commander, is responsible for planning and effecting the relocation of repair and maintenance shops. During the cold seasons, each tank should be equipped with a device to warm meals for its crew. The KG-4t (PG-4t), galley should be introduced on to tanks as soon as possible, and all new tanks will be equipped with device to warm up meals and tea. The readiness of tank troops will be further enhanced by equipping each battalion with a PAK-170 field kitchen mounted on a cross-country wheeled vehicle or else on a tracked vehicle.

SUB CODE: 15, 19/ SUBM DATE: none

Cord 1/1

RAZORENOV, S

AID P - 4676

Subject : USSR/Aeronautics - Training (DOSAAF)

Card 1/1 Pub. 58 - 2/14

Author : Ignat'yev, S. and S. Razorenov

Title : The quality of the training in flying must be improved

Periodical : Kryl. rod., 4, 3-4, Ap 1956

Abstract : The article deals with the methods of training of pilots in the Aeroclubs of the DOSAAF. Individual approach to the trainees is advocated and the importance of theoretical instruction and ground training is stressed. Some recommendations are made as to the conduct of flying exercises. Stricter approach in the appreciation of the qualifications of the instructors is requested. No factual data of interest.

Institution : None

Submitted : No date

IGNAT'YEV, S.; RAZORENOV, S.

For high standards in flight training. Kryn.rod.7 no.4:3-4 Ap '56.  
(Flight training) (MLRA 9:7)

R. RAZORENOV, D.

85-9-19/33

AUTHORS: Razorenov S., Ignat'yev S.

TITLE: In What an Insufficient Exactingness May Result (K chemu privodit nizkaya trebovatel'nost')

PERIODICAL: Kryl'ya Rodiny 1957, Nr 9, pp. 20-21 (USSR)

ABSTRACT: The authors offer an analysis of the causes of some deficiencies in the work of the aeroclubs of the Belorussian SSR. The various minor shortcomings the authors deal with are blamed on the not-rigorous-enough training of DOSAAF instructors, on the want of method in the work with young pilots and the general lack of interest in the problems of methodology, on the fact that the leading members of the clubs omit often to check upon the way the instruction is given, and on the inadequate organization of flight exercises, leading to flight accidents. -The most criticized are the aeroclubs Vitebskiy, Gomel'skiy and Mogilevskiy. The article offers no information of scientific interest.

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